Title (en)

AUXETIC STRUCTURES WITH ANGLED SLOTS IN ENGINEERED PATTERNS FOR CUSTOMIZED NPR BEHAVIOR AND IMPROVED COOLING PERFORMANCE

Title (de)

AUXETISCHE STRUKTUREN MIT GENEIGTEN SCHLITZEN IN MANIPULIERTEN MUSTERN FÜR MASSGESCHNEIDERTES NPR-VERHALTEN UND VERBESSERTER KÜHLLEISTUNG

Title (fr)

STRUCTURES AUXÉTIQUES À FENTES INCLINÉES SELON DES MOTIFS MIS AU POINT POUR UN COMPORTEMENT NPR PERSONNALISÉ ET PERFORMANCES DE REFROIDISSEMENT AMÉLIORÉES

Publication

EP 3242758 B1 20190911 (EN)

Application

EP 16735531 A 20160109

Priority

- US 201562101840 P 20150109
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Abstract (en)

[origin: WO2016112368A1] Auxetic structures, effusion-cooling auxetic sheets, systems and devices with auxetic structures, and methods of using and methods of making auxetic structures are disclosed. An auxetic structure is disclosed which includes an elastically rigid body with opposing top and bottom surfaces. First and second pluralities of elongated apertures extend through the elastically rigid body from the top surface to the bottom surface. The first plurality of elongated apertures extends transversely with respect to the second plurality of elongated apertures. The first and/or second pluralities of elongated apertures are obliquely angled with the top surface of the elastically rigid body. The elongated apertures are cooperatively configured to provide a desired cooling performance while exhibiting stress reduction through negative Poisson's Ratio (NPR) behavior under macroscopic planar loading conditions. For example, the auxetic structure may exhibit an effusion cooling effectiveness of approximately 30-50 Eta and a Poisson's Ratio of approximately -0.2 to -0.9%.

IPC 8 full level

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CPC (source: EP US)

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